WHAT IS CLAIMED IS:

1. An image processing apparatus for converting the resolution of an original image in such a manner as to increase the spatial resolution of said original image by a factor of Z in each of vertical and horizontal directions, said image processing apparatus comprising:

energy calculating means for calculating local energy of said original image;

detection means for detecting the direction of an edge on the basis of said local energy calculated by said energy calculating means;

interpolation means for interpolating a new pixel from a pixel of said original image on the basis of the direction of the edge detected by said detection means; and

edge enhancement means for performing an edge enhancement process on the basis of said local energy calculated by said energy calculating means.

2. An image processing apparatus according to Claim 1, further comprising edge conversion means for converting a loose connection of said original image into a tight connection before said energy calculating means calculates said local energy.

3. An image processing apparatus according to Claim 2, wherein said energy conversion means replaces the value of a particular pixel with the mean value of values of two pixels on the basis of values of pixels lying on a diagonal line.

4. An image processing apparatus according to Claim 1, wherein when said local energy is greater than a predetermined threshold value, said edge enhancement means performs a one-dimensional filtering process such that the values of pixels are multiplied by corresponding coefficients of a one-dimensional edge building filter and the respective products are added together.

5. An image processing apparatus according to Claim 1, wherein said interpolation means and said edge enhancement means perform the interpolation and the edge enhancement upon said original image in each of vertical and horizontal directions.

6. An image processing apparatus according to Claim 1, wherein said interpolation means interpolates one new pixel from two pixels lying along the detected direction of the edge.

7. An image processing apparatus according to Claim 1,

wherein said interpolation means performs linear interpolation when the edge is not detected by said detection means.

8. An image processing apparatus according to Claim 1, further comprising consistency judging means for judging the consistency in terms of the local structure of the pixel interpolated by said interpolation means, wherein said interpolation means performs linear interpolation when said consistency judging means judges that there is no consistency.

9. An image processing apparatus according to Claim 1, wherein said energy calculating means creates an energy map having a size corresponding to the size of said original image.

10. An image processing apparatus according to Claim 1, wherein when the value of Z is greater than 2, said interpolation means and said edge enhancement means perform, N times, processes which are to be performed when the value of Z is equal to 2 and perform, one time, processes which are to be performed when the value of Z is equal to or smaller than 2.

11. An image processing method of converting the resolution of an original image in such a manner as to increase the spatial resolution of said original image by a factor of Z in each of vertical and horizontal directions, said image processing method comprising the steps of:

calculating local energy of said original image;

detecting the direction of an edge on the basis of said local energy calculated in said energy calculating step;

interpolating a new pixel from a pixel of said original image on the basis of the direction of the edge detected in said detection step; and

performing an edge enhancement process on the basis of said local energy calculated in said energy calculating step.

12. A storage medium storing thereon a computer-readable program for controlling an image processing apparatus to convert the resolution of an original image in such a manner as to increase the spatial resolution of said original image by a factor of Z in each of vertical and horizontal directions, said program comprising the steps of:

calculating local energy of said original image;

detecting the direction of an edge on the basis of said local energy calculated in said energy calculating step;

interpolating a new pixel from a pixel of said original image on the basis of the direction of the edge detected in

said detection step; and

performing an edge enhancement process on the basis of said local energy calculated in said energy calculating step.